

REMARKS

Claims 1-12 have been examined and have been rejected under 35 U.S.C. § 103(a).

I. Rejections under 35 U.S.C. § 103(a) in view of U.S. Patent No. 4,600,370 to Kaneko et al. (“Kaneko”) (assigned to Bridgestone Corporation) and JP 59-081156 to Irie (“Irie”)

The Examiner has rejected claims 1-5, 7 and 8 under 35 U.S.C. § 103(a) in view of Kaneko and Irie.

A. Claim 1

Claim 1 recites, “placing the green tire on a green tire support table provided with a lower tire bead correcting unit at a predetermined position in horizontal attitude so as to surround the lower tire bead correcting unit.”

The Examiner maintains that the lower arcuate segment 32 of Kaneko discloses the claimed lower tire bead correction unit (pg. 2 of Office Action). Applicant notes, however, that the alleged lower correction unit 32 is not provided on the support table 70 as claimed (see Fig. 16). Rather, the alleged lower correction unit 32 is supported by the upper arcuate segments 26 (alleged upper tire bead correcting unit). Accordingly, when an unvulcanized tire 29 lies on the support table 70, the upper and lower arcuate segments 26 and 32 are initially arranged above the tire 29 via the swivel arm 1 (col. 9, lines 48-59). Once positioned, the upper and lower arcuate segments 26 and 32 are lowered down and inserted into the upper and lower bead portions 30 and 31 of the tire 29 via the piston rod 58 (col. 9, lines 59-66).

On page 3 of the Office Action, the Examiner acknowledges that the support table 70 of Kaneko is not provided with the lower arcuate segment 32, as claimed, but contends that such

location is merely a matter of design choice. Furthermore, the Examiner cites to Irie (e.g., Fig. 4) as showing a support table provided with a lower tire bead correction unit and maintains that it would be obvious to locate the lower arcuate segment 32 of Kaneko on the support table 70 in view of the teachings of Irie.

Applicant traverses the Examiner's assertion and submits that one skilled in the art would not be motivated to modify Kaneko with the teachings of Irie since such modification would fundamentally alter the function of Kaneko. In particular, the upper and lower arcuate segments 26 and 32 are formed to work in tandem. For example, the piston rod 58 lowers the upper and lower arcuate segments 26 and 32, at the same time, into the tire 29 and then causes both segments 26 and 32 to come into contact with the bead portions of the tire 29 via the rotary member 12, also at the same time (col. 9, line 59 to col. 10, line 7). The tire 29 is then elevated off the support table 70 and supported by both the upper and lower arcuate segments 26 and 32 for additional processing and transporting to mold 50 (Fig. 17; col. 10, lines 14-44).

On page 3 of the Office Action, the Examiner maintains that the proposed modification would be obvious to provide a "suitable location for securing the bead correction unit." Since, however, the lower arcuate segment 32 of Kaneko is integrally formed with the upper arcuate segments 26 and works in cooperation with the upper arcuate segments 26, Applicant submits that one skilled in the art would not be motivated to modify Kaneko to provide the lower arcuate segments 32 on the support table 70 because such location in Kaneko would not be structurally suitable.

Furthermore, claim 1 recites, “moving the plurality of pressing members included in the lower tire bead correcting unit radially outward to shape the lower tire bead into a completely round shape of a predetermined diameter.”

In column 10, lines 9-14, Kaneko discloses that since the lower arcuate segments 32 are brought into abutting engagement with the support table 70, the lower bead support members 44 (alleged pressing members) “slightly contact” the lower bead portion 31 of the tire 29. Since the alleged pressing members 44 only slightly contact the lower bead portion 31, the alleged pressing members 44 will not actually *shape* the tire bead into a completely round shape, as recited in claim 1.

In further regard to the points raised above, Applicant refers to the following teachings of Kaneko:

Column 6, lines 41-45:

"as shown in FIG. 6, the upper and lower arcuate segments 26 and 32 are radially contracted by the operation of the horizontal cylinder 16 and that the upper and lower arcuate segments 26 and 32 are overlapped with each other".

Column 6, lines 46-50:

"the swivel arm 1 turns horizontally until the upper and lower arcuate segments 26 and 32 are arranged above a predetermined position at which the unvulcanized pneumatic tire 29 lies on a mounting table (not shown)".

Column 6, lines 52-59:

"the upper bead support ends 28 of the upper arcuate segments 16 are inserted inside the upper bead portion 30 of the unvulcanized tire 29. The rotary member 12 is then driven to rotate by the operation of the horizontal cylinder 16 to bring the upper arcuate segments 26 into engagement with the inner circumferential face of the upper bead portion 30 of the unvulcanized tire 29."

Column 6, line 62- column 7, line 3:

"With the upper bead portion 30 supported by the upper arcuate segments 26, the swivel arm 1, the vertical cylinder 2 and the upper arcuate segments 26 as a whole are moved upward by the arm 1, --. After the unvulcanized tire 29 is raised from the mounting table, the lower arcuate segments 32 protrude downward from the upper arcuate segments 26 as the piston rod 4 protrudes downward from the vertical cylinder 2."

Column 7, line 10-15:

"The lower arcuate segments 32 further move downward until the support portions 44a of the lower bead support members 44 are brought into abutting engagement at their lower surfaces with the inner circumferential face of the lower bead portions 31 as shown in FIG.7."

It will be understood from the foregoing that the unvulcanized tire 29 is placed only initially on a mounting table and no operation is carried out by the lower arcuate segments 32 on the tire 29. The tire 29 is simply picked up from the mounting table by the upper arcuate segments 26 which are brought into engagement with the tire 29, while the lower arcuate segments 32 are simply raised together with the upper arcuate segments 26 without doing anything on or to the tire 29. The lower arcuate segments 32 are then moved downward relative to the upper arcuate segments 26 in the state in which the tire 29 has been raised upward over the mounting table by the upper arcuate segments 26. In other words, the lower arcuate segments 32 are brought into engagement with the lower bead portion 31 of the tire 29 while the tire 29 is in a floating state above the mounting table.

The upper arcuate segments 26 and the lower arcuate segments 32 are brought into engagement with the upper bead portion 30 and the lower bead portion 31, respectively, in the state in which the tire 29 is suspended over the mounting table. In such suspended state of the tire 29, asymmetrical deformation resulting from viscous elasticity of the unvulcanized tire are

removed because the upper and lower bead portion 30 and 31 of the tire are supported in opposite directions by the upper and lower arcuate segments 26 and 32, respectively (see column 7, lines 24-29 of Kaneko).

Although the upper and lower arcuate segments 26 and 32 are movable radially inward and outward by the operation of the horizontal cylinder 16 (FIG. 1), however, the radial movement of these upper and lower arcuate segments 26 and 32 is for enabling these segments 26 and 32 to move into the interior of the tire and to simply engage the upper and lower bead portion 30 and 31 of the tire. Thus, Applicant submits that both the upper and lower arcuate segments 26 and 32 of Kaneko are *not* intended for and are *not* used for positive radial outward movement to shape a tire into a completely round shape of a predetermined diameter, as clearly recited in claim 1. The upper and lower arcuate segments 26 and 32 are simply not adapted to be used for shaping in radially outward directions. Such radially outward shaping operation is enabled in the present invention by the tire support table (3; 70). Unvulcanized tires tend to deform easily so that the shaping of such tires can be carried out reliably only by supporting the tires on a tire supporting table while the shaping operation is carried out, as employed in the present invention. Thus, the claimed features are not merely matters of obvious design choice as alleged by the Examiner.

In further regard to the above, Applicant submits that in Kaneko, both the upper and lower arcuate segments 26 and 32 engage the upper and lower bead portions 30 and 31 of the tire 29 at their free lower extremities. Such configuration is not adapted for the positive radially outward shaping, but rather is adapted for light engagement as taught in the reference.

Applicant submits that the foregoing discussion also applies to the second embodiment

described from line 48 of column 9 onward in Kaneko. FIG. 16 of Kaneko shows a mounting table 70 on which an unvulcanized tire 29 is mounted. The upper and lower arcuate segments 26 and 32 are in engagement with the upper bead portion 30 and the lower bead portion 31 of the tire 29, respectively, as in the first embodiment explained above. Column 10, lines 10-14 of the reference states, "since the lower arcuate segments 32 are brought into abutting engagement at their lower extremities with the mounting table 70 as shown in FIG. 16 and raised slightly, the lower bead support members 44 slightly contact the lower bead portion 31". This description indicates that the lower bead support members 44 of the lower arcuate segments 32 are simply and lightly put on the lower bead portion 31. Such a "simple or light placement" indicates that a radially outward shaping operation of the tire is never carried out.

Claim 1 also recites, "vertically moving at least either of the lower and the upper tire bead correcting unit relative to the other to adjust an axial distance between the upper and the lower tire bead to a predetermined axial bead spacing."

As set forth above, in the claimed invention, at least either of the lower and upper tire bead correcting units (10,50; 20) is vertically moved to adjust the axial distance between the upper and lower tire beads (Bu B1). Applicant submits that this operation to obtain a predetermined axial bead spacing is never carried out in Kaneko. For example, while the upper and lower arcuate segments 26 and 32 in Kaneko are movable vertically relative to each other, the relative vertical movement is performed to set the vertical positions of the segments 26 and 32 so as to match the vertical distance between the upper and lower bead portions 30 and 31 when the segments 26 and 32 are lowered as shown in FIGS. 7 and 16.

At least based on the foregoing, Applicant submits that claim 1 is patentable over the cited reference.

B. Claim 2

Applicant submits that claim 2 is patentable at least by virtue of its dependency.

C. Claim 3

Since claim 3 recites features that are analogous to the features discussed above for claim 1, Applicant submits that claim 3 is patentable for at least analogous reasons as claim 1.

D. Claims 4, 5, 7 and 8

Applicant submits that claims 4, 5, 7 and 8 are patentable at least by virtue of their dependency.

II. Rejections under 35 U.S.C. § 103(a) in view of Kaneko, Irie and U.S. Patent No. 4,268,219 to Nakagawa et al. (“Nakagawa”)

The Examiner has rejected claims 6 and 11 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kaneko, Irie and Nakagawa.

Since Nakagawa fails to cure the deficient teachings of Kaneko and Irie, at least in regard to claim 3, Applicant submits that claims 6 and 11 are patentable at least by virtue of their dependency.

Also, claim 6 recites, “wherein the driving means for moving the sliding members radially includes projections formed respectively on the sliding members; a cam disk provided with spiral slots in which the projections on the sliding members are engaged, respectively, and supported for turning about the center axis of the lower tire bead correcting unit; and an actuator for turning the cam disk.”

The Examiner acknowledges that Kaneko and Irie fail to disclose the above features. Accordingly, the Examiner cites to Nakagawa. As shown in Figure 7, Nakagawa discloses the use of spiral slots in a cam disk. Applicant submits, however, that such a design is not compatible with the configuration of Kaneko (i.e., where the lower arcuate segments 32 are connected to and work in tandem with the upper arcuate segments 26). For example, as set forth above, Kaneko fails to teach “radially outward shaping” of the upper and lower beads of a tire. The “radially outward shaping” requires positive radially outward movement of the pressing members (13; 29). Since Kaneko fails to teach the “radially outward shaping,” persons skilled in the art would not be motivated to use Nakagawa’s spiral slots in a cam disk in Kaneko to perform positive radially outward movement. Thus, Applicant submits that Nakagawa is not compatible with the configuration of Kaneko.

At least based on the foregoing, Applicant submits that claim 6 is patentable over the cited references.

III. Rejections under 35 U.S.C. § 103(a) in view of Kaneko, Irie and U.S. Patent No. 5,830,513 to Fukuda (“Fukuda”)

The Examiner has rejected claims 9 and 10 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kaneko, Irie and Fukuda. Since claims 9 and 10 are dependent upon claim 3 and Fukuda fails to cure the deficient teachings of Kaneko and Irie, at least in regard to claim 3, Applicant submits that claims 9 and 10 are patentable at least by virtue of their dependency.

IV. Rejection under 35 U.S.C. § 103(a) in view of Kaneko, Irie and JP 58-018724 (“JP ‘724”)

The Examiner has rejected claim 12 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kaneko, Irie and JP ‘724. Since claim 12 is dependent upon claim 3 and JP ‘724 fails to cure the deficient teachings of Kaneko and Irie, at least in regard to claim 3, Applicant submits that claim 12 is patentable at least by virtue of its dependency.

In regard to the above, Applicant notes that claim 12 incorrectly depended from claim 1 rather than claim 3. Accordingly, by this Amendment, Applicant has amended the dependency.

V. Newly Added Claim

By this Amendment, Applicant has added new claim 13 to provide more varied protection of the present invention.

VI. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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